Armed Forces College of Medicine
AFCM

(spinal cord anatomy)

TRACTS 2

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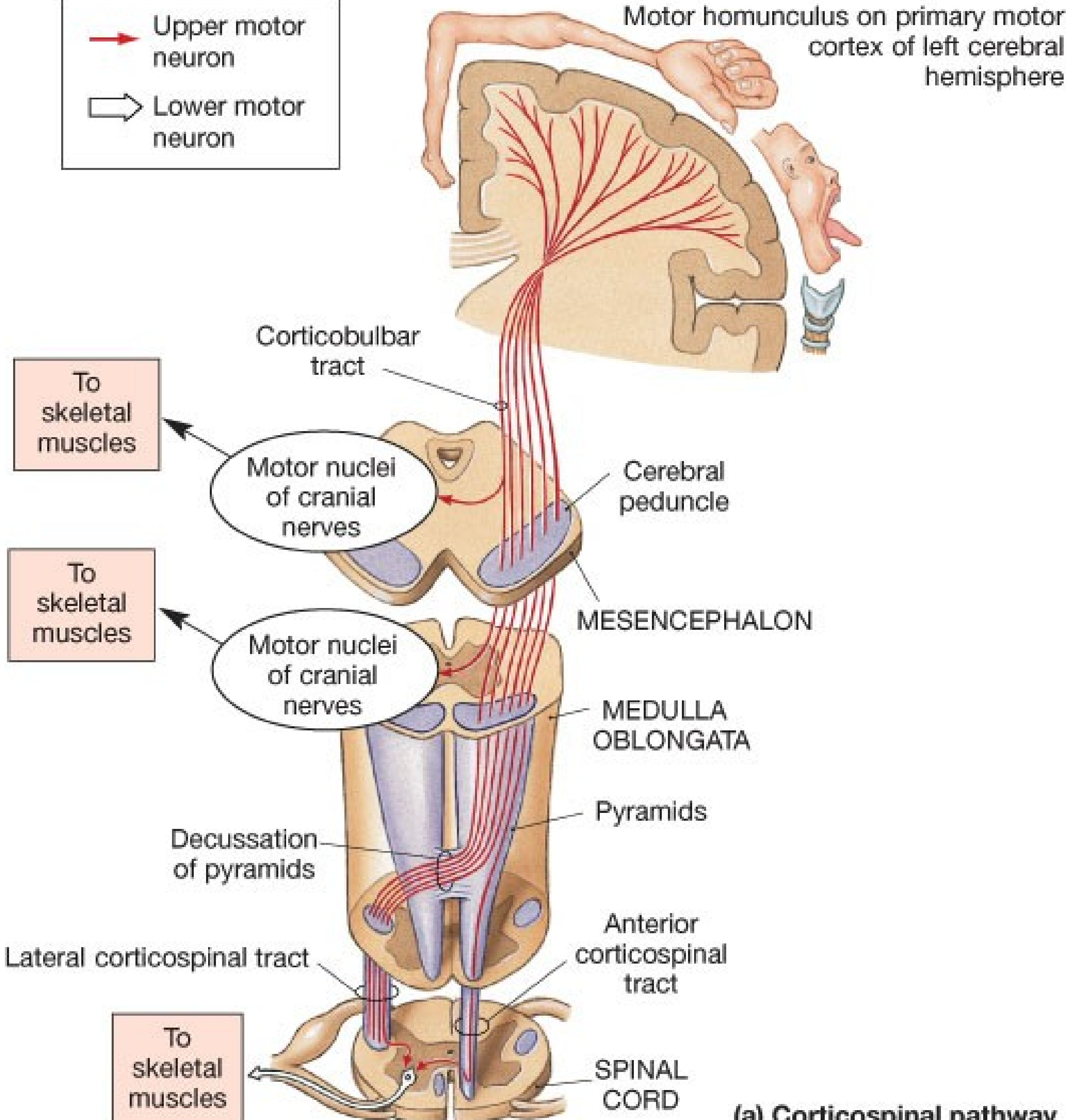
ILOS

- **Describe** the function, beginning , position , lamination and termination of descending tracts

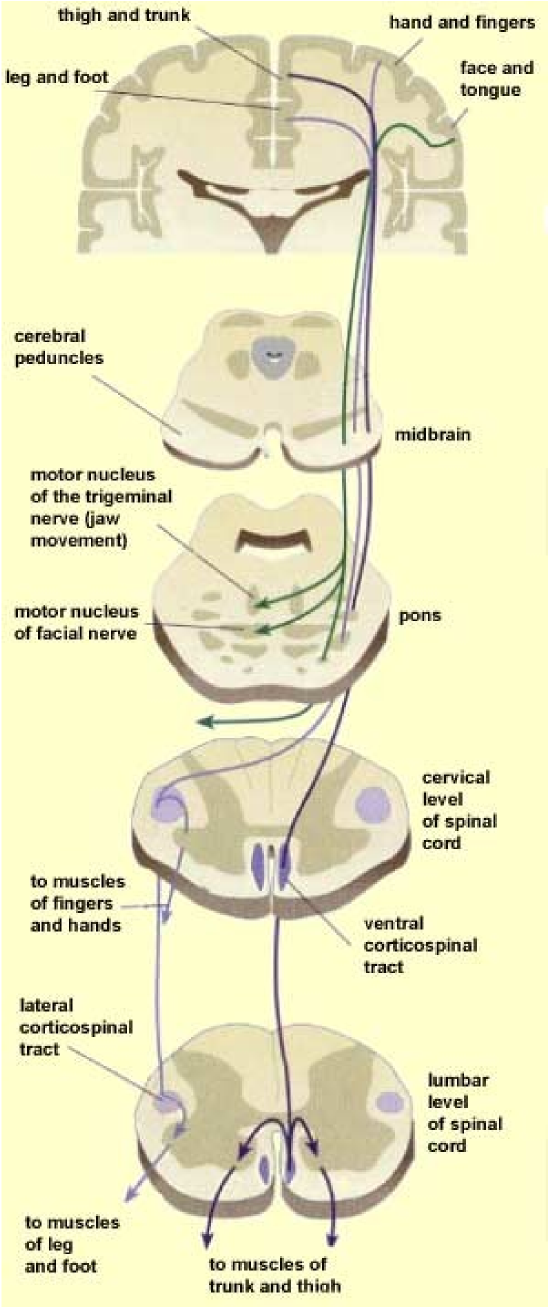
Descending Tracts

Pyramidal tract

- Origin : neurons of motor and premotor area
- Axons converge in corona radiata
- Pass in anterior 2/3 of posterior limb of internal capsule
- Descends in middle 3/5 of crus of mid brain
- Descend as scattered bundles in pons
- Fibers collect to form pyramid of medulla
- 80% of fibers cross in lower most part of medulla& descend as lateral corticospinal tract in lateral white column
- 20% are uncrossed and descend as anterior corticospinal(usually they cross at lower level)



(a) Corticospinal pathway


thigh and trunk
hand and fingers
leg and foot
face and tongue
cerebral peduncles
midbrain
motor nucleus of the trigeminal nerve (jaw movement)
motor nucleus of facial nerve
pons
cervical level of spinal cord
to muscles of fingers and hands
ventral corticospinal tract
lateral corticospinal tract
lumbar level of spinal cord
to muscles of leg and foot
to muscles of trunk and thigh

Lamination, Termination of pyramidal tract

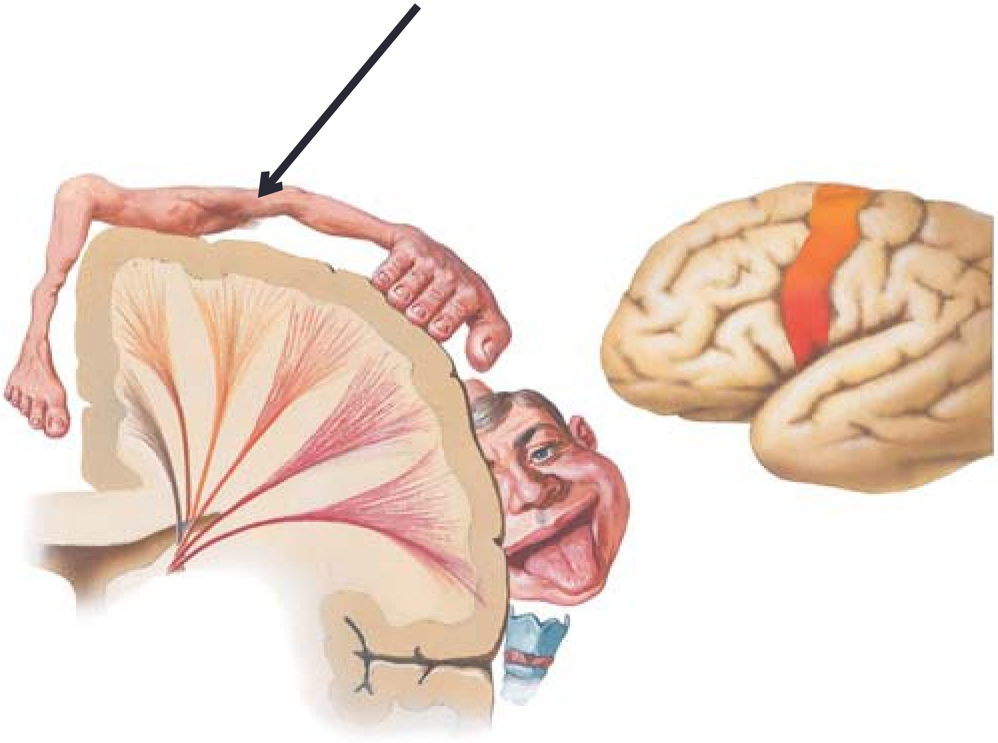
Lamination:

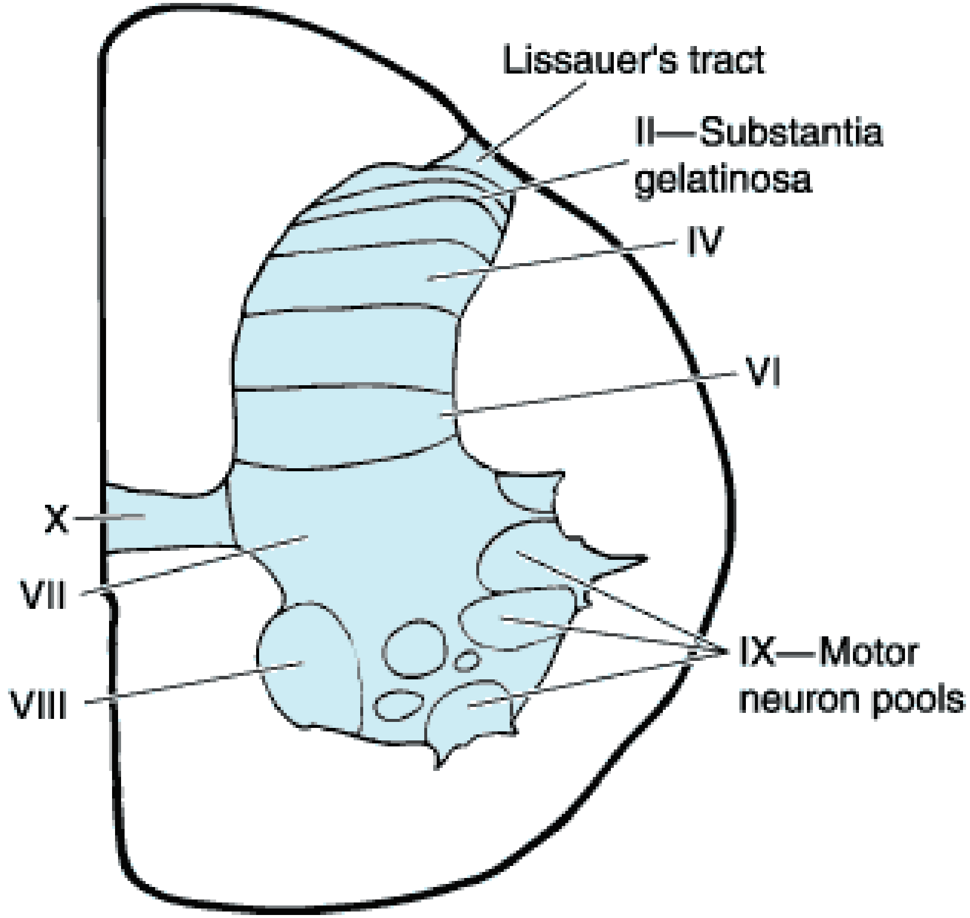
- in cerebral cortex body is presented up side down
- In internal capsule: upper limb anterior, lower limb posterior .
- In mid brain and spinal cord: cervical are medial and sacral are lateral

Termination:

- 1-crossed fibers end on lateral group of anterior horn cells to supply limbs
- 2- uncrossed fibers end on medial group of anterior horn cells of both sides supplying trunk

In cerebral hemisphere body is presented upside down





Lissauer's tract
II—Substantia gelatinosa
IV
VI
X
VII
VIII
IX—Motor neuron pools

Cortico bulbar

- Some pyramidal fibers end on motor nuclei of cranial nerves present in brain stem
- All cranial nerve nuclei receive bilateral corticobulbar except

➢ Facial nucleus that supplies muscle of lower part of face

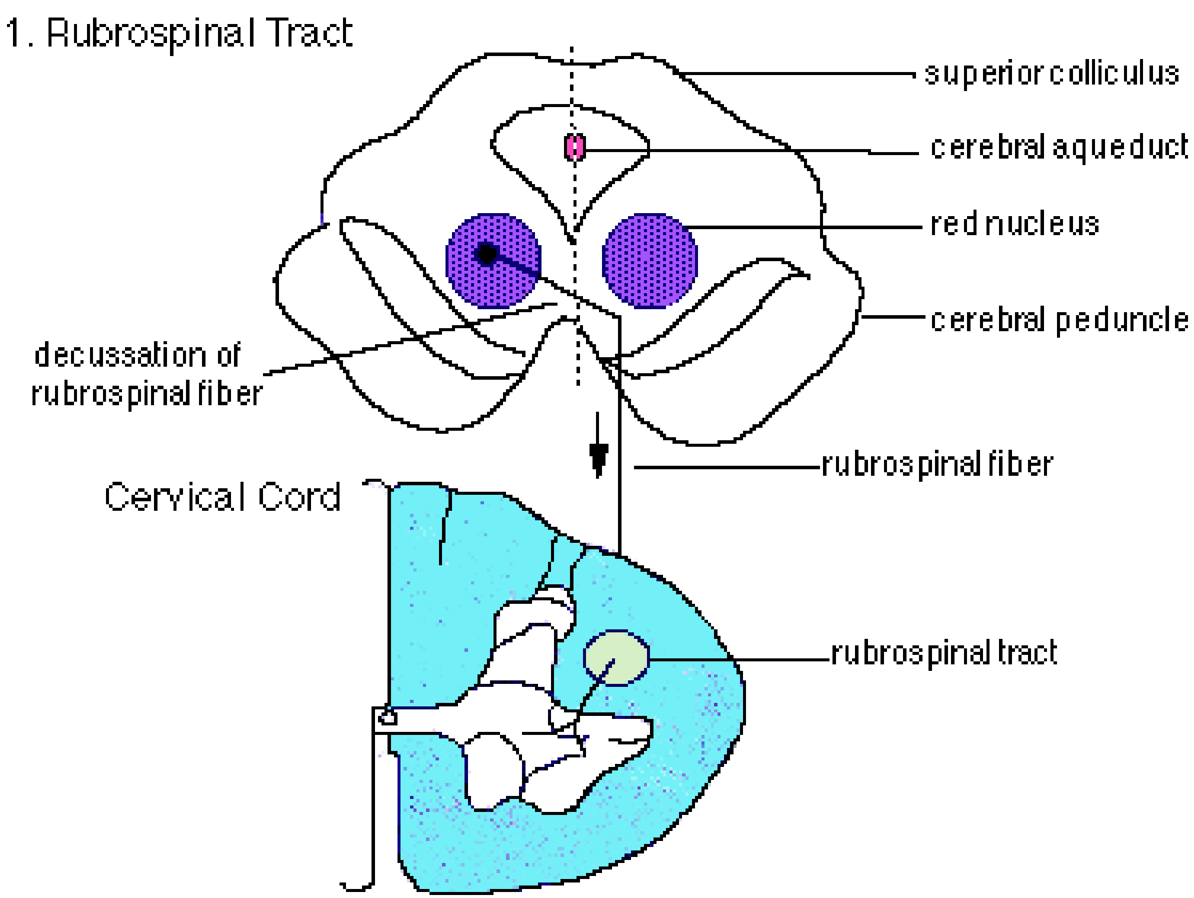
➢ Hypoglossal nucleus that supplies genioglossus

Both receive contra lateral supply only



Extra- Pyramidal Tracts

- Rubrospinal
- Tectospinal
- Medial vestibulospinal
- Lateral vestibulospinal
- Medial reticulospinal
- Lateral reticulospinal

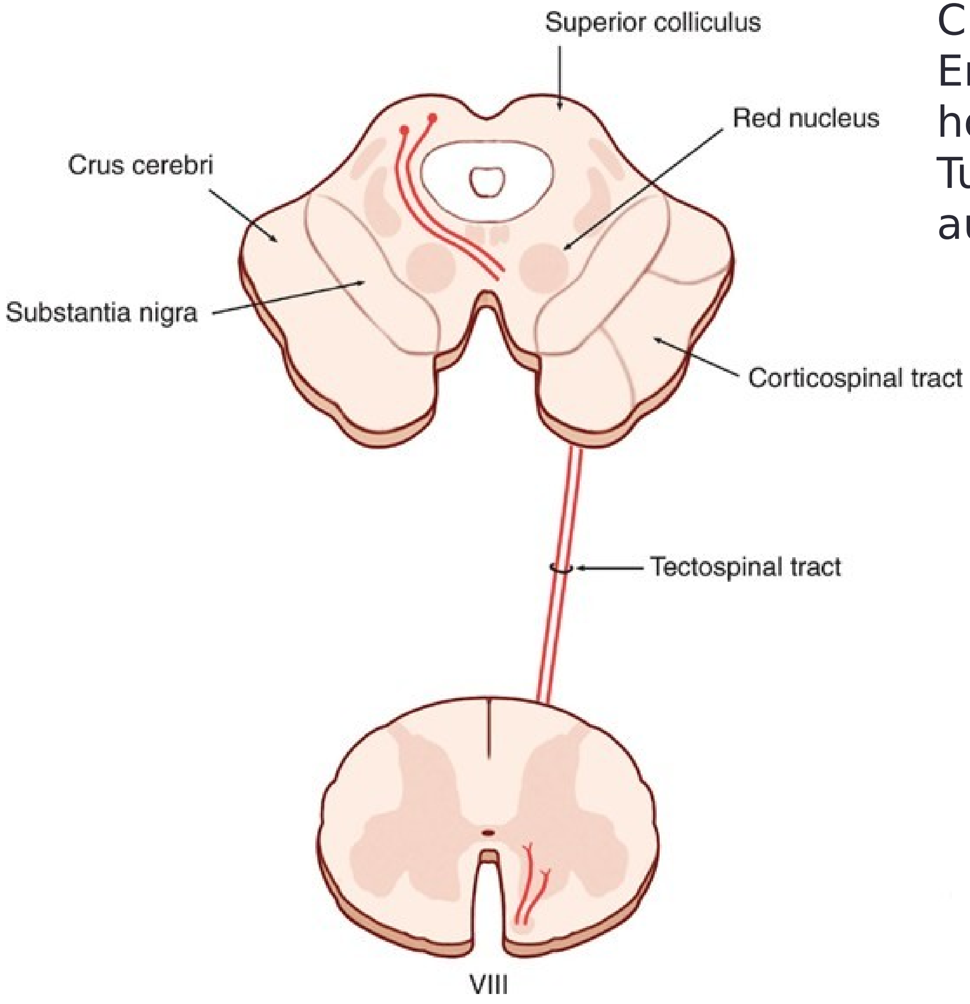


Rubrospinal :

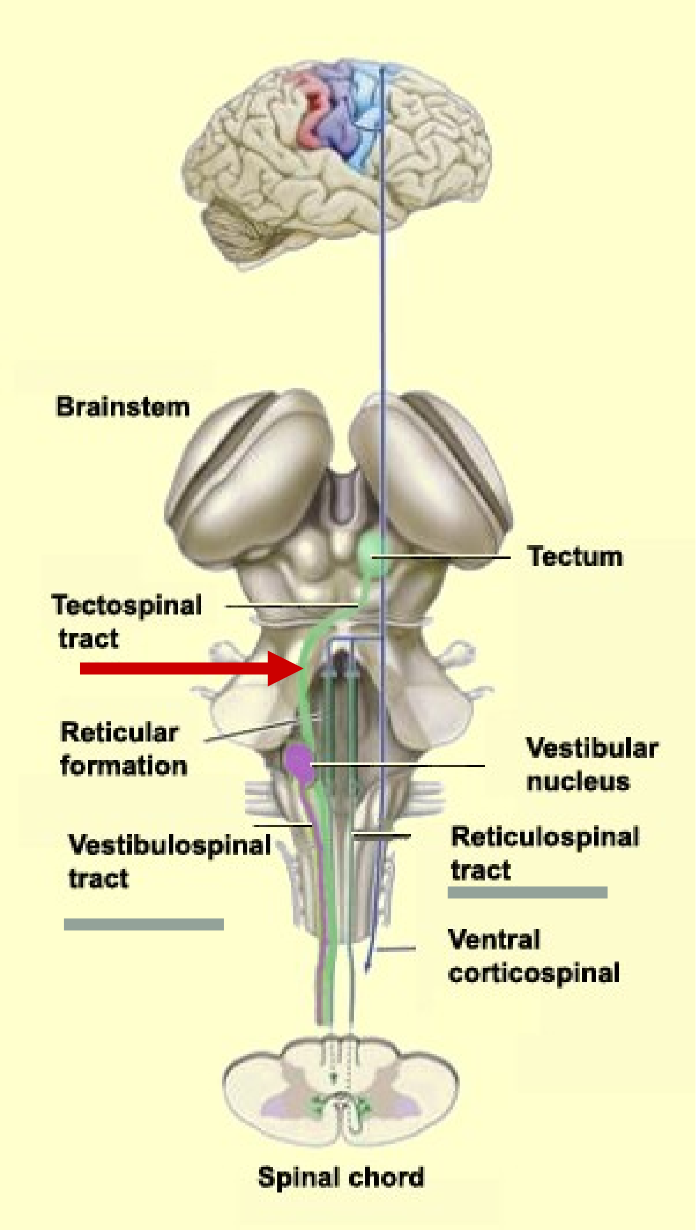
- Origin : red nucleus
- Decussate in ventral decussation
- Lies in lateral white column of cervical segment
- Lateral group of cervical anterior horn cells
- Facilitate flexors of upper limb

Tectospinal tracts

- Origin: superior colliculus
- Cross in dorsal decussation
- End in medial group of cervical of anterior horn cells
- Turning of head and neck in response to auditory and visual & cutaneous



Origin: superior colliculus
Cross in dorsal decussation
End in medial group of cervical of anterior horn cells
Turning of head and neck in response to auditory and visual & cutaneous


Brainstem
Tectum
Tectospinal tract
Reticular formation
Vestibular nucleus
Vestibulospinal tract
Reticulospinal tract
Ventral corticospinal
Spinal chord

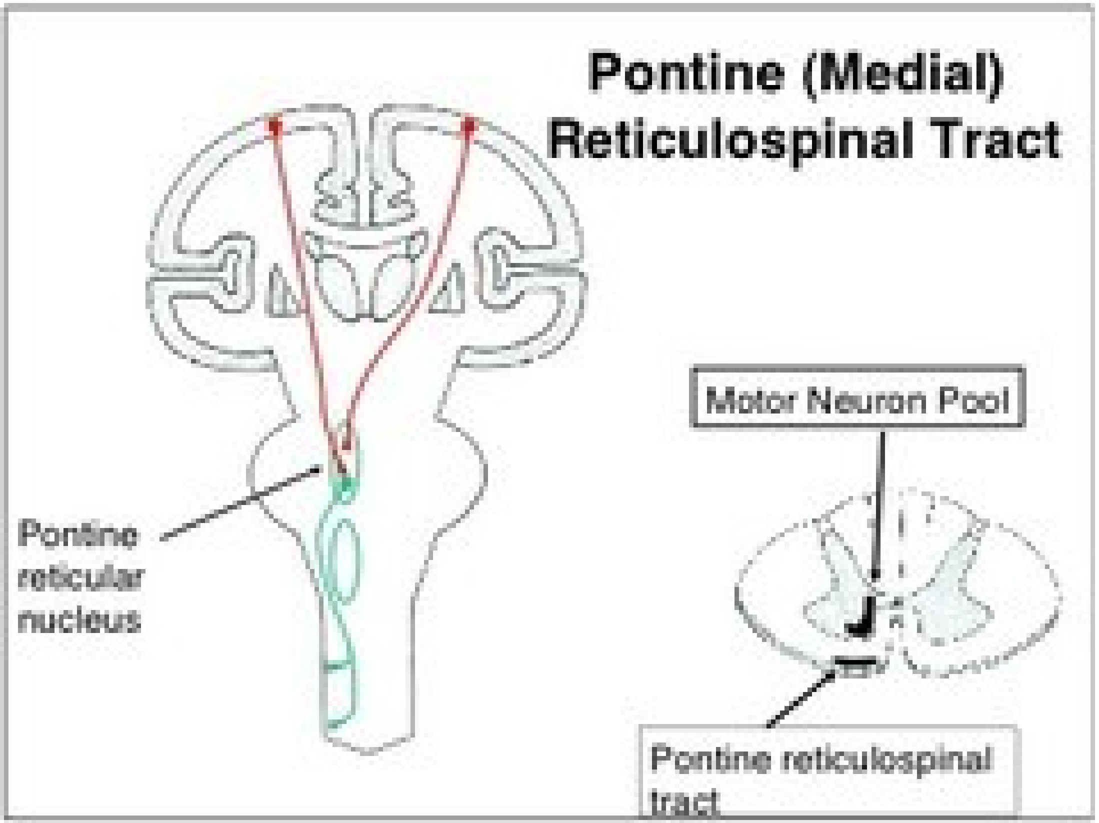
Reticulo-spinal tracts

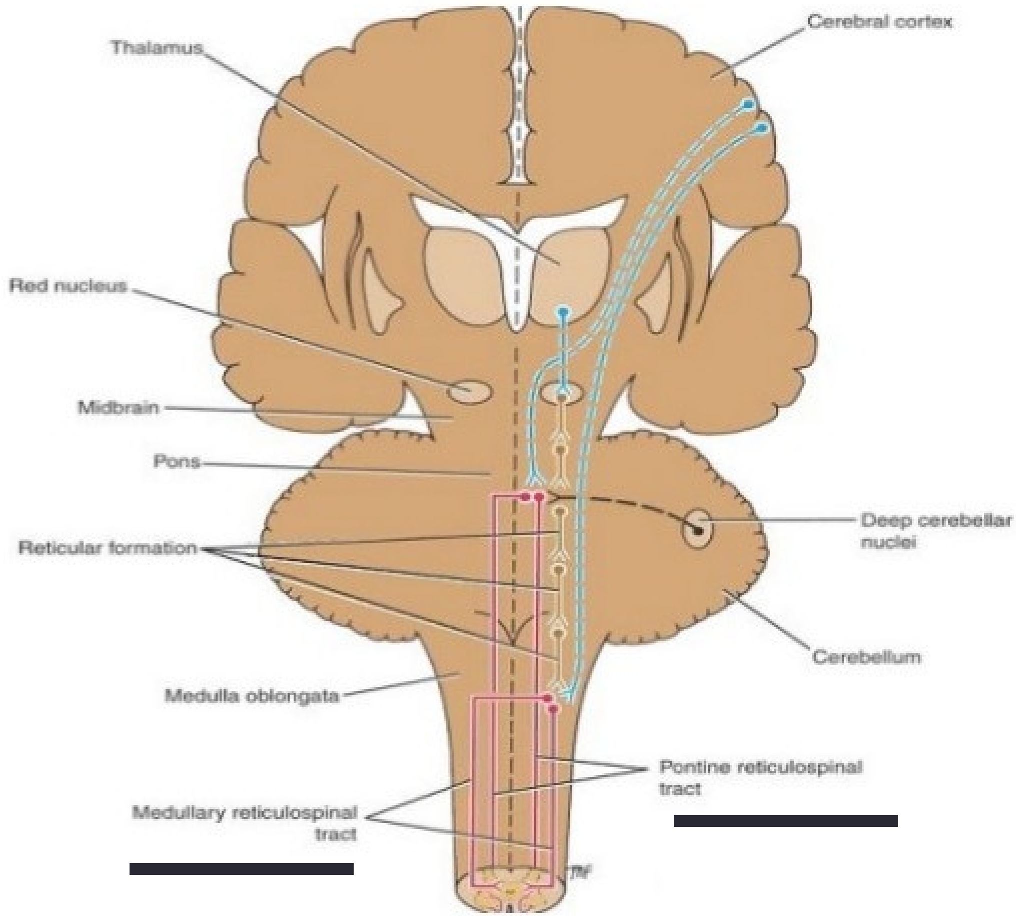
Medial reticulo-spinal

- Pontine reticular formation
- Uncrossed
- Anterior column
- Gamma motor neuron of lamina IX
- Facilitate extensors

Lateral reticulo-spinal

- Medullary reticular format
- Crossed
- Lateral column
- Gamma motor neuron of lamina IX
- Inhibit extensors


Pontine (Medial)
Reticulospinal Tract
Motor Neuron Pool
Pontine
reticular
nucleus
Pontine reticulospinal
tract

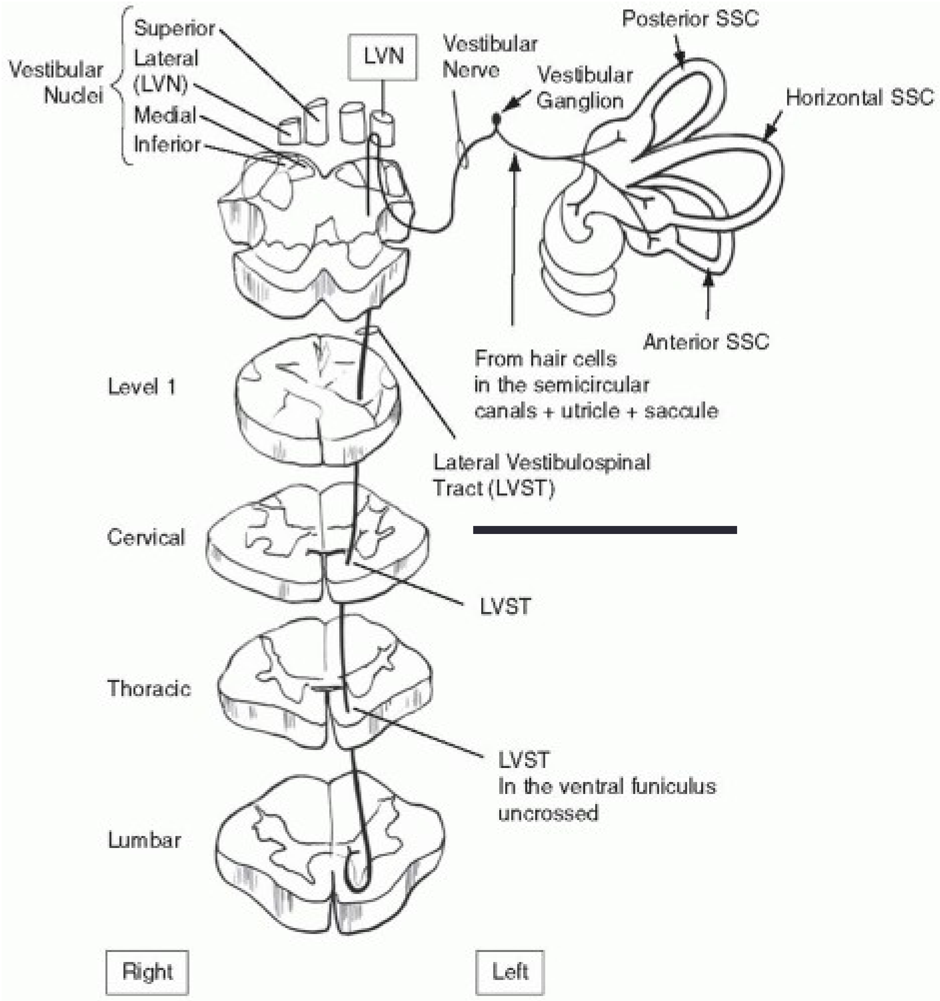

Thalamus
Cerebral cortex
Red nucleus
Midbrain
Pons
Reticular formation
Deep cerebellar nuclei
Cerebellum
Medulla oblongata
Pontine reticulospinal tract
Medullary reticulospinal tract

Vestibulo-spinal tracts

Medial vestibulospinal

- Arise from medial vestibular
- Anterior column to T3
- Alpha and gamma neurons of extensors
- Keep head and vision horizontal when body is tilted

- **Lateral vestibulo** Lateral vestibular nucleus
- Anterior column whole length
- Alpha and gamma neurons of extensors
- Adjust body posture in response to cerebellar impulse


Vestibular Nuclei
Superior
Lateral (LVN)
Medial
Inferior
LVN
Vestibular Nerve
Vestibular Ganglion
Posterior SSC
Horizontal SSC
Anterior SSC
From hair cells in the semicircular canals + utricle + saccule
Level 1
Lateral Vestibulospinal Tract (LVST)
Cervical
LVST
Thoracic
LVST
In the ventral funiculus uncrossed
Lumbar
Right
Left

Thank you

